Weekly Summary Report
USEPA Oversight, Sauget Area 1, Sauget, IL
WA No. 239-RSBD-054V / Contract No. 68-W6-0025

Week Ending Friday, October 1, 2004

This report summarizes the Remedial Investigation/Feasibility Study (RI/FS) fieldwork conducted by Monsanto, Solutia, and their contractors from September 26, 2004 through October 1, 2004 at Sauget Area 1 Sites. The current RI/FS work consists of a dense non-aqueous phase liquid (DNAPL) Characterization and Remediation Study. CH2M HILL provided field oversight on six days during the week.

Contractors Onsite

- Golder Associates (consultant for Monsanto/Solutia)
- Groundwater Services Inc. (consultant/contractor to Monsanto/Solutia for the DNAPL Characterization and Remediation Study)
- Philip Environmental (IDW Services subcontractor to Groundwater Services Inc.)
- Prosonic Corporation (drilling subcontractor to Groundwater Services Inc.)

Work Performed This Week

Groundwater Services Inc. (GSI) and Prosonic Corporation (Prosonic) were onsite during the week conducting work for Task 4 of the DNAPL Characterization and Remediation Study Work Plan (GSI, April 2004), Soil Sampling and Installation of Piezometers. Golder Associates (Golder) was onsite during the week managing fieldwork on behalf of Monsanto/Solutia. During the week, five soil borings were drilled and bedrock piezometers were installed.

Soil Boring / Installation of Piezometers

Prosonic drilled soil borings and installed piezometers into bedrock cores at five locations during the week. The work was conducted under the direction of GSI on behalf of Solutia/Monsanto.

Soil borings were drilled and piezometers installed at the following locations during the week:

- A1-04 at Site L
- A1-07 at Site I
- A1-09 at Site I
- A1-10 at Site I
- A1-17 at Site G

Prosonic used sonic technology to drill the soil borings at Sauget Area 1. A 4-inch core barrel was utilized to advance the boring and collect samples. Subsequently, a 6-inch override casing was advanced to support the borehole. Additionally, a 7-inch override casing was used in the waste/fill areas to isolate the waste. Boreholes were drilled five feet into competent bedrock and continuously screened for the presence of non-aqueous phase liquid (NAPL).

Soil Logging and Field DNAPL Screening Tests

Soils were logged, continuously sampled and tested during drilling operations. Each 10-foot core was examined using the following field measures:

- Visual and olfactory observations to log soil and geologic conditions and to visually screen for the presence of NAPL
- Head-space analysis of each 2½-foot interval of core using a Photoionization Detector (PID) to screen for organic vapors
- Sudan dye soil testing vials, which will indicate the presence of oil in the tested volume of soil
- FLUTe™ strips, a dye-impregnated colored ribbon, directly applied to the soil core, which visually indicates the presence of NAPL

The field screening results and observations are summarized in Table 1.

Waste material was observed in borings A1-04 and A1-10. In Boring A1-04, waste material was observed between approximately 5 to 15 feet below ground surface (bgs). The waste material was composed of wood fragments and rubber intermixed with a fine silty clay. In Boring A1-10, a small amount of waste material composed of wood chips and metal fragments intermixed in a silty sand matrix was observed between approximately 3.5 to 5 feet bgs. There was no visual evidence of NAPL in the soil at either of these borings.

Borings A1-07 and A1-09 were advanced outside of the landfill waste boundaries, and no landfill waste material was observed in either boring. There was no visual evidence of NAPL in the soil at A1-07. However, in Boring A1-09, visual evidence of oil was observed in the soil from 25 to 27.5 feet bgs. Dark brown streaks were observed on the surface of water within the sample sleeve at this depth inerval. Elevated PID readings and were observed from 25 to 82.5 feet bgs, and positive Sudan dye test results were observed at intermittent depths within this interval. Coupled with the Sudan dye tests and PID measurements, the information gathered in the field indicates that residual DNAPL may be present in the soil at Boring A1-09.

Boring A1-17 was a shallow boring advanced outside of the landfill waste boundary to a final depth of 25 feet bgs. No landfill waste material or visual evidence of NAPL was observed in this boring. A slight odor was noted at approximately 24.5 to 25 feet bgs.

Soil Sampling

GSI collected one soil sample from each 10-foot interval of soil core to be submitted for laboratory analysis of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and total organic carbon (TOC). Each 10-foot soil core was sectioned into 2½-foot intervals, with criteria aimed to select the interval for analyses based on the results of the field screening, with preference to more potentially impacted intervals. Chemical analyses of soil samples will be conducted by Severn Trent Laboratories in Savannah, Georgia.

Additionally, three to four relatively undisturbed samples were collected from each boring using a split-spoon sampler and brass liners to contain the sample. The samples were frozen on dry ice and wrapped in plastic for storage. Three relatively undisturbed samples from each borehole, representing the shallow, middle, and deep-hydrogeologic units (SHU, MHU, and DHU, respectively) will be analyzed for physical properties including porosity, bulk density, and grain size. For each fill area, one relatively undisturbed sample from each of the waste interval, shallow, middle, and deep-hydrogeologic units will have DNAPL mobility tested. Additionally,

three to four samples from each site will be analyzed for pore fluid saturation using the Dean-Stark procedure. The chemical and physical properties analysis of all split spoon samples will be conducted by PTS Laboratories in California. The specific analyses conducted on each of the split spoon samples will be determined following a review of the chemical analysis results of the soil samples.

Piezometer Installation

Five piezometers were installed during week at A1-04, A1-07, A1-09, A1-10, and A1-17. The piezometers A1-04, A1-07, A1-09, and A1-10 were constructed to expose the screen to the bedrock core and the interval directly above bedrock in the DHU. The four borings were drilled approximately five feet into competent limestone bedrock. The piezometer A1-17 was installed at a final depth of 25 feet bgs and is screened across the groundwater surface of the SHU.

All five of the piezometers were screened over a 15-foot length above total depth. Piezometers were constructed using 2-inch diameter stainless steel screen with a 0.010-inch aperture and 2-inch diameter stainless steel riser.

Piezometer construction proceeded by pouring sand directly into the borehole annulus around the well screen. Sand was poured to a depth approximately 2 feet above the top of the well screen, followed by a bentonite chip seal of at least 3 feet in thickness. The 6-inch override casing was retracted from the borehole as the filter pack and bentonite seal were placed. A cement-bentonite grout was used to fill the borehole annulus from the top of the bentonite seal to within 3 feet of ground surface. The remaining 3 feet of annular space was filled with concrete as the piezometer surface completion was constructed in order to minimize the effects of frost heave.

Philip Environmental constructed the surface completions for nine piezometers during the week, thus all piezometers installed to date had completions constructed. The surface completions included the installation of either a stainless steel protective well casing over the well riser or a flush mount completion within the concrete pad at ground surface. Philip Environmental also placed concrete jersey barriers around the piezometers after installation to provide permanent guards from damage at each location.

Investigation-Derived Waste (IDW)

Solid IDW from each borehole was placed in 55-gallon drums, with soil cuttings from waste intervals placed in separate drums. Phillip Environmental transported IDW drums to the Judith Lane field facility, where solid IDW from the 'non-waste' intervals was transferred into a roll-off box. IDW from the waste intervals will be characterized separately. Liquid IDW was collected at each borehole and transferred to a 'frac-tank' located at the Judith Lane facility.

Health and Safety

Initial drilling at each borehole location within a waste/fill area commenced with all personnel donning Level C Personal Protective Equipment (PPE) including respirator and Tyvek® chemical retardant suits. An exclusion zone was established around the drill rig and sampling area within which Level C PPE was required. At A1-09, personnel started drilling in Level D PPE and upgraded to Level C because of elevated PID readings in the breathing zone as the 35 to 45 foot interval was cored and sampled. After this interval was extracted, PID readings remained at low levels in the breathing zone, and personnel were able to downgrade to Level D PPE.

The breathing zone was frequently monitored using a calibrated PID to check organic vapor concentrations throughout drilling operations. Additionally, a large fan was utilized to ventilate

the drilling platform as an engineering control to minimize potential organic vapors in the breathing zone.

NAPL Survey

On September 30, 2004, GSI conducted a NAPL survey of the piezometers installed to date including A1-02 and A1-03 at Site H; A1-16, A1-17, and A1-18 at Site G; A1-04 at Site L; and A1-07, A1-08, A1-09, A1-10, and A1-11 at Site I.

The NAPL survey at these wells consisted of the following measurements:

- An oil/water interface probe was used to measure the depths to water and potential NAPL at each piezometer.
- A teflon bailer was lowered into the top of water present in each piezometer. The bailer was visually inspected for the presence of a sheen or LNAPL.
- A weighted cotton string was lowered to the bottom of each piezometer and then inspected for potential DNAPL staining on the string.
- A teflon bailer was lowered to the total depth of each piezometer. The bailer was visually inspected for the presence of a sheen or DNAPL.

At each of the eleven piezometers, none of the above measurements indicated any potential presence of NAPL. Specifically, no staining or visible sheen was observed in any of the tests.

Work Anticipated Next Week

Prosonic and GSI traveled home for the weekend on September 30. Work is scheduled to resume on October 5. Drilling activities and piezometer installation will continue next week at the remaining seven locations.

TABLE 1
Field Screening Tests and Soil Boring/Piezometer Installation Summary
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ID	Site	Date Installed	Approx. Bedrock Depth	Screen Interval	Significant Observations	Odor	FLUTe™ Strip Tests	Sudan Dye Tests	Significant PID Readings
A1-03	Site H	Sept. 10	100'	100-115'	None	None to slight	All negative	All negative	331 ppm within waste at 8-10'
A1-02	Site H	Sept. 12	107'	98-113'	None	None to strong odor	All negative	3 positive results (either few red droplets or staining in jar) at 58-60', 63-65', and 68-70'	538 ppm within waste at 8-10' 50-52': 471 ppm, 58-60': 233 ppm
A1-16	Site G	Sept. 14	116'	106-121'	Black staining at ~27'	Odor within waste, slight odor up to 70'	All negative	4 positive results (either few red droplets or staining in jar) within waste at 3-5', and 8-15'	Readings between 50-100 ppm at 28-30, 43-45', and 63-65'
(Location near existing LNAPL well, EE-11)									
A1-11	Site I	Sept. 15	116'	106-121'	None	None	All negative	1 positive result (red specks, adhered to sediment particles) at 103-105'	None
A1-08	Site I	Sept. 23	111'	102-119'	Oily film at some intervals. A sheen and/or dark brown to black droplets of oily residue visible in some intervals.	Odor observed throughout borehole	All negative	31 of 38 tests (81%) positively indicated oil in soil, (red film/droplets/stain or pink colored ball). Notably – between 0-10' (surface) and 107.5-111' (two intervals above bedrock) the results were negative.	Max. result (957 ppm) at 5-7.5' interval. 36 of 39 tests (92%) were >100 ppm. Notably – two intervals near total depth (105-110') had slightly lower results (61 and 67 ppm)
A1-18	Site G	Sept. 24	115'	106-121'	None	Slight odor observed between 5-65'.	All negative	6 of 33 tests (18%) were positive. Results were marginally positive (slight pink color on ball).	Max. result (295 ppm) within waste at 7.5-10'. 11 of 42 results were >50 ppm, all between 5-45'.
A1-04	Site L	Sept. 25	110'	100'-115'	None	Slight odor observed between 27.5-30'.	All negative	All negative	136 ppm within waste at 12.5 to 15'

ID	Site	Date Installed	Approx. Bedrock Depth	Screen Interval	Significant Observations	Odor	FLUTe™ Strip Tests	Sudan Dye Tests	Significant PID Readings
A1-07	Site I	Sept. 26	111'	103'-118'	None	None	All negative	3 of 22 tests (14%) were positive (all three with few red droplets in jar but only one with pink ball).	None
A1-10	Site I	Sept. 27	112'	104'-119'	None	None	All negative	All negative	None
A1-09	Site I	Sept. 29	111.5'	104'-119'	Dark oily streaks observed in water in 25-27.5' interval.	Odor observed from 25-82.5'.	All negative	8 of 30 tests (27%) were positive (red droplets and staining in jar, ball stained pink).	Max result (383 ppm) at 25-27.5' interval. 8 of 41 tests (20%) within soil boring were >100 ppm.
A1-17	Site G	Sept. 30	NE	10'-25'	None	Slight odor from 24.5-25'.	All negative	All negative	None

Notes:
All depths are in feet below ground surface

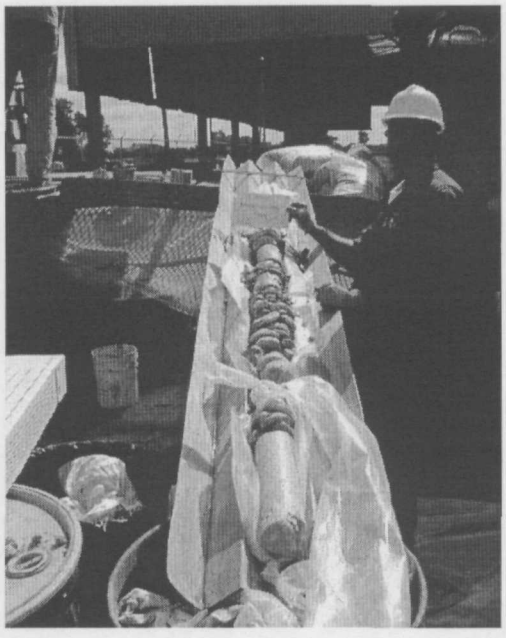
NE – Not encountered

Photos from September 25, through October 1, 2004:

Drilling and collecting samples at A1-07, Site I, began drilling in Level C PPE (September 26, 2004).

Split barrel sample from Boring A1-07. Sample contained in brass sleeves and subsequently placed on dry ice (September 26, 2004).

Limestone bedrock core from Boring A1-07 ranging from 112 to 118 feet bgs (September 26, 2004).



Limestone bedrock core from Boring A1-09 ranging from 111.5 to 119 feet bgs (September 29, 2004).